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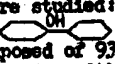
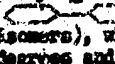
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ORTHOXYDIPHENYL AS A DISINFECTANT

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The purpose of this work is to test the value of oxydiphenyl as a disinfectant. This preparation has a number of advantages: it is inexpensive, harmless to humans and animals, free from unpleasant odor in the production process, and is soluble in water when used in the form of a weak alkaline paste.

Two specimens of the preparation were studied: (1) Purified orthoxydiphenyl. The formula for oxydiphenyl is  for orthoisomer and  for para-isomer, (composed of 93-95% ortho- and 5-7% para-isomers), which is a light rose-colored powder with a melting point of 70-71 degrees and a weak odor of resin. It is soluble in alcohol, alcohol-water solutions and in alkali solutions. (2) Water-soluble alkaline paste, containing 48% commercial orthoxydiphenyl (contains a mixture of 85% ortho- and 15% para-isomers), 13% caustic soda and 39% water.

1. Bactericidal Capacity and Phenol Coefficient of Orthoxydiphenyl

Determination of the phenol coefficient was made for the first of the above-mentioned specimens of the preparation. The residual indicators -- bactericide culture, albumin index, bactericide coefficients in disinfection of test materials and secretions -- were determined for the 48% paste containing oxydiphenyl in the form of a phenolate. *Staph aureus* was selected as a representative of the cocci group and intestinal bacillus was taken as a representative of the Salmonella genus. The phenol coefficient was deter-

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mined according to the accepted TaNIDI (Gen Sci Res Disinfectant Inst) method, with the exception that instead of water solutions, solutions of oxydiphenyl in 10% alcohol were used for testing, and dilution of the preparation was titrated in order of 1:200, for example, 1/2,600 - 1/2,800 - 2/3,000.

The tests showed that the tested preparation is 20 times more active than phenol and is bacteriostatic in a dilution of approximately 1:3,000 for intestinal bacilli and in a dilution of 1:2,500 for staphylococcus. Comparative study of the paste showed that its bactericidal action is approximately two thirds of the basic substance.

Albumin indices (indicators of a decrease in the activity of the preparation in the presence of 10% serum) of the oxydiphenyl paste upon application to intestinal bacillus, staphylococcus aureus and blue pus bacillus according to the TaNIDI method was 1.7-3.3. A more significant index (from 3.5 to 6) was observed only for staphylococcus. The activity of oxydiphenyl with regard to gram-negative microbes decreased only 2-3 times in the presence of albumin. These indicators permit us to assume that in biological substrata the bactericidal capacity of oxydiphenyl will be lowered insignificantly.

2. Test of Oxydiphenyl for Disinfection of the Test Objects

The activity of large molecular compounds of the phenol group is sharply curtailed in the presence of adsorbents. Therefore, test objects made of batiate, natural silk, filter paper, pine shavings, porcelain, lump chalk, sheet steel (0.3 mm thick) and wood covered with an oil enamel were selected for testing. The quantity of solution in each case was determined by a calculation of one ml for 150 sq mm of the surface of the specimen. Intestinal bacillus and staphylococcus aureus were tested. The data obtained showed that intestinal bacillus is killed on the material and paper test objects upon application of low concentrations of 0.05 to 1%, and staphylococcus in concentrations of 0.5 to 5%. The metal (with a concentration of 0.02 to 0.1% for both types of microbes) and the oil paint (with a concentration less than 0.01 to 0.05%) are easily disinfected. This indicates that substrata with a smooth surface are comparatively easy to disinfect.

On the other hand, materials having a rough surface and a fine porous structure (for example, chalk, unglazed porcelain and especially wood) require either high concentrations of the disinfectant (solutions containing 3-5% of the active ingredient) or lengthy exposure of 30 minutes for disinfection. Disinfection of wood (in the case of staphylococcus aureus) was successful only at a temperature of 40 degrees. At a lower temperature disinfection was not successful even with a 5% content of the active ingredient in the tested solution.

3. Test of Oxydiphenyl Paste in Disinfecting Excreta

Test on the disinfection of pus, urine and feces were conducted according to the TaNIDI method. These tests showed that the oxydiphenyl paste is bactericidal for microbes found in any of the studied biological substrata. Intestinal bacillus found in urine is killed within 5 minutes in 0.03% concentration of the preparation. Staphylococcus is killed under the same conditions with a 1% concentration of the solution. A longer exposure is required to disinfect pus and feces. The disinfection of pus from staphylococcus aureus requires large quantities of the solution of the disinfecting material (ratio of 2:1 to the volume of pus with an exposure of not less than 20 minutes). Blue pus bacillus found in pus was much less resistant and is killed after 10 minutes in a 1% concentration of the preparation. Feces are disinfected by a solution containing not less than 3.5-5% of the active ingredient with an exposure of not less than one hour.

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4. Proposed Applications and Conditions Under Which Oxydiphenyl Paste Is Practical to Use as a Disinfectant

The research conducted shows that oxydiphenyl is a valuable preparation and has many uses as a disinfectant (disinfection of underwear, dishes, instruments, various types of secretions, working space, furniture, and a number of other household objects).

Low concentrations of oxydiphenyl are required in the majority of cases for practical use, especially when it is considered that the solutions are prepared from paste. For disinfection of woolen and silk (natural silk) material, oxydiphenyl paste must be applied carefully since with excess alkalinity of the preparation the paste which we studied contained 1.4% free alkali, or 0.14% in a 10% solution, some decrease of the durability of the material can be expected.

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